



## SEQUENCE LISTING

<110> Slater, Michael  
Huang, Fen  
Hartnett, James

<120> Mutant TNE Polymerases

<130> PRMG-04578

<140> 09/641,319

<141> 2000-08-18

<150> 09/385,986

<151> 1999-08-30

<150> 08/484,661

<151> 1995-06-07

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<170> PatentIn version 3.0

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 His Asp Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu Leu  
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Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
420 425 430	
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1344
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
435 440 445	
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1392
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
450 455 460	
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	

atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	

gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	

gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
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Trp Ser	
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Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
 370 375 380  
 Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
 385 390 395 400  
 His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
 405 410 415  
 Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
 420 425 430  
 Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
 435 440 445  
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 450 455 460  
 Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
 465 470 475 480  
 Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
 485 490 495  
 Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
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 Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
 545 550 555 560  
 Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
 565 570 575  
 Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
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 Trp Ser  
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 Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
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 Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
 35 40 45  
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 Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
 50 55 60  
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 Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val  
 65 70 75 80



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Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
85 90 95	
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	336
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
100 105 110	
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg	384
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
115 120 125	
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Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
130 135 140	
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Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
145 150 155 160	
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	528
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
165 170 175	
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa	576
Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu	
180 185 190	
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Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu	
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gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata	672
Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile	
210 215 220	
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Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
225 230 235 240	
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	768
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
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Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu	
260 265 270	
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His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
275 280 285	
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Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
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Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
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Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
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His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
370 375 380	
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Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
385 390 395 400	
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Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
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Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
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Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
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Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
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Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
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ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1488
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
485 490 495	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1536
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
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Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
515 520 525	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1632
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
530 535 540	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1680
Glu Lys Glu Glu Leu Leu Asp Leu Val Lys Asn Lys Met Thr Asn Val	
545 550 555 560	



Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
165 170 175

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
180 185 190

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
195 200 205

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
210 215 220

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
225 230 235 240

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
245 250 255

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
260 265 270

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
275 280 285

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
290 295 300

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
305 310 315 320

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
325 330 335

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
340 345 350

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
355 360 365

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
370 375 380

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
385 390 395 400

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
405 410 415

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
420 425 430

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
435 440 445

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
450 455 460

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
465 470 475 480

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
485 490 495

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
500 505 510

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
515 520 525

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
530 535 540

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
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Trp Ser

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Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
	260 265 270
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	864
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
	275 280 285
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag	912
Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu	
	290 295 300
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg	960
His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
	305 310 315 320
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc	1008
Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
	325 330 335
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg	1056
Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg	
	340 345 350
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa	1104
Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu	
	355 360 365
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg	1152
Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
	370 375 380
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct	1200
Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
	385 390 395 400
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc	1248
His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
	405 410 415
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa	1296
Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
	420 425 430
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1344
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
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ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1392
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
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ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
	465 470 475 480



cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
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aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
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ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	

ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
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545 550 555 560	

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Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	

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Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	

gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
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35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
 50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
 65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
 85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val  
 100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
 115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
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Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
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Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
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Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
 565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
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Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
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Trp Ser  
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<220>

<221> misc\_feature

<223> Synthetic

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<221> CDS

<222> (1)..(1830)

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 Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu  
 1 5 10 15

48

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys 20 25 30	96
gag gtt cca tct ttt gcc ctg gac ctt gac acg tcc tcc ctt gac ccg Glu Val Pro Ser Phe Ala Leu Asp Leu Asp Thr Ser Ser Leu Asp Pro 35 40 45	144
ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr 50 55 60	192
gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu 65 70 75 80	240
aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser 85 90 95	288
aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val 100 105 110	336
aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala 115 120 125	384
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser 130 135 140	432
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser 145 150 155 160	480
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp 165 170 175	528
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu 180 185 190	576
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val 195 200 205	624
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768

gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc	816
Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
260 265 270	
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	864
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
275 280 285	
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag	912
Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu	
290 295 300	
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg	960
His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
305 310 315 320	
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc	1008
Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
325 330 335	
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg	1056
Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg	
340 345 350	
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa	1104
Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu	
355 360 365	
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg	1152
Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
370 375 380	
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct	1200
Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
385 390 395 400	
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc	1248
His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
405 410 415	
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa	1296
Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
420 425 430	
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1344
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
435 440 445	
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1392
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
450 455 460	
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	

aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
595 600 605	
tgg tct tga	1833
Trp Ser	
610	

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<211> 610

<212> PRT

<213> Artificial/Unknown

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<221> misc\_feature

<223> Synthetic

<400> 19

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
1 5 10 15

Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Asp Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala	Tyr	Tyr	Ile	Pro	Leu	His	His	Arg	Asn	Ala	Gln	Asn	Leu	Asp	Glu	
65					70					75					80	
Thr	Leu	Val	Leu	Ser	Lys	Leu	Lys	Glu	Ile	Leu	Glu	Asp	Pro	Ser	Ser	
				85					90					95		
Lys	Ile	Val	Gly	Gln	Asn	Leu	Lys	Tyr	Asp	Tyr	Lys	Val	Leu	Met	Val	
			100					105					110			
Lys	Gly	Ile	Ser	Pro	Val	Tyr	Pro	His	Phe	Asp	Thr	Met	Ile	Ala	Ala	
		115					120					125				
Tyr	Leu	Leu	Glu	Pro	Asn	Glu	Lys	Lys	Phe	Asn	Leu	Glu	Asp	Leu	Ser	
	130					135					140					
Leu	Lys	Phe	Leu	Gly	Tyr	Lys	Met	Thr	Ser	Tyr	Gln	Glu	Leu	Met	Ser	
145					150					155					160	
Phe	Ser	Ser	Pro	Leu	Phe	Gly	Phe	Ser	Phe	Ala	Asp	Val	Pro	Val	Asp	
				165					170						175	
Lys	Ala	Ala	Asn	Tyr	Ser	Cys	Glu	Asp	Ala	Asp	Ile	Thr	Tyr	Arg	Leu	
			180					185						190		
Tyr	Lys	Ile	Leu	Ser	Met	Lys	Leu	His	Glu	Ala	Glu	Leu	Glu	Asn	Val	
		195					200						205			
Phe	Tyr	Arg	Ile	Glu	Met	Pro	Leu	Val	Asn	Val	Leu	Ala	Arg	Met	Glu	
	210					215					220					
Leu	Asn	Gly	Val	Tyr	Val	Asp	Thr	Glu	Phe	Leu	Lys	Lys	Leu	Ser	Glu	
225					230					235					240	
Glu	Tyr	Gly	Lys	Lys	Leu	Glu	Glu	Leu	Ala	Glu	Lys	Ile	Tyr	Gln	Ile	
				245					250					255		
Ala	Gly	Glu	Pro	Phe	Asn	Ile	Asn	Ser	Pro	Lys	Gln	Val	Ser	Lys	Ile	
			260					265						270		
Leu	Phe	Glu	Lys	Leu	Gly	Ile	Lys	Pro	Arg	Gly	Lys	Thr	Thr	Lys	Thr	
		275					280					285				
Gly	Ala	Tyr	Ser	Thr	Arg	Ile	Glu	Val	Leu	Glu	Glu	Ile	Ala	Asn	Glu	
	290					295					300					



His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
595 600 605

Trp Ser  
610

<210> 20

<211> 39

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<213> Artificial/Unknown

<220>

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39

<210> 21

<211> 39

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc\_feature

<223> Synthetic

<400> 21  
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39

<210> 22

<211> 1833

<212> DNA

<213> Artificial/Unknown

<220>

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<221> CDS

<222> (1) .. (1830)

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Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu	
1 5 10 15	

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	
20 25 30	

gag gtt cca tct ttt gcc ctg gac ctt gaa acg tcc tcc ctt gac ccg	144
Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro	
35 40 45	

ttc aac tgt gag ata gtc ggc atc tcc gtg tgc ttc aaa ccg aaa aca	192
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr	
50 55 60	

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa	240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu	
65 70 75 80	

aca ctg gtg ctg tgc aag ttg aaa gag atc ctc gaa gac ccg tct tgc	288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser	
85 90 95	

aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta	336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val	
100 105 110	

aag ggt ata tgc cca gtt tat ccg cat ttt gac acg atg ata gct gca	384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
115 120 125	

tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
130 135 140	

ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tgc	480
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
145 150 155 160	

ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac	528
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
165 170 175	

aag gct gcg aac ttc tcc tgc gag gat gca gat atc act tat agg ctc	576
Lys Ala Ala Asn Phe Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
180 185 190	

tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	624
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
195 200 205	

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344

ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu 565 570 575	1728
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val 580 585 590	1776
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser 595 600 605	1824
tgg tct tga Trp Ser 610	1833
<210> 23	
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<212> PRT	
<213> Artificial/Unknown	
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<223> Synthetic	

<400> 23

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu  
1 5 10 15

Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys  
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro  
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val  
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
165 170 175

Lys Ala Ala Asn Phe Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
595 600 605

Trp Ser  
610

<210> 24

<211> 32

<212> DNA

<213> Artificial/Unknown

<220>

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<223> Synthetic

<400> 24

actcctgcga gaatgctgac atcacttata gg

32

<210> 25

<211> 1833

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<223> Synthetic



<220>

<221> CDS

<222> (1) .. (1830)

<400> 25

atg	aag	gaa	ctt	caa	ctg	tac	gaa	gaa	gca	gaa	ccc	acc	gga	tac	gaa	48
Met	Lys	Glu	Leu	Gln	Leu	Tyr	Glu	Glu	Ala	Glu	Pro	Thr	Gly	Tyr	Glu	
1				5					10					15		

atc	gtg	aag	gat	cat	aag	acc	ttc	gaa	gat	ctc	atc	gaa	aag	ctg	aag	96
Ile	Val	Lys	Asp	His	Lys	Thr	Phe	Glu	Asp	Leu	Ile	Glu	Lys	Leu	Lys	
			20					25					30			

gag	gtt	cca	tct	ttt	gcc	ctg	gac	ctt	gaa	acg	tcc	tcc	ctt	gac	ccg	144
Glu	Val	Pro	Ser	Phe	Ala	Leu	Asp	Leu	Glu	Thr	Ser	Ser	Leu	Asp	Pro	
		35				40						45				

ttc	aac	tgt	gag	ata	gtc	ggc	atc	tcc	gtg	tcg	ttc	aaa	ccg	aaa	aca	192
Phe	Asn	Cys	Glu	Ile	Val	Gly	Ile	Ser	Val	Ser	Phe	Lys	Pro	Lys	Thr	
	50					55					60					

gct	tat	tac	att	cca	ctt	cat	cac	aga	aac	gcc	cag	aat	ctt	gat	gaa	240
Ala	Tyr	Tyr	Ile	Pro	Leu	His	His	Arg	Asn	Ala	Gln	Asn	Leu	Asp	Glu	
65					70					75					80	

aca	ctg	gtg	ctg	tcg	aag	ttg	aaa	gag	atc	ctc	gaa	gac	ccg	tct	tcg	288
Thr	Leu	Val	Leu	Ser	Lys	Leu	Lys	Glu	Ile	Leu	Glu	Asp	Pro	Ser	Ser	
				85					90					95		

aag	att	gtg	ggt	cag	aac	ctg	aag	tac	gac	tac	aag	gtt	ctt	atg	gta	336
Lys	Ile	Val	Gly	Gln	Asn	Leu	Lys	Tyr	Asp	Tyr	Lys	Val	Leu	Met	Val	
			100					105					110			

aag	ggt	ata	tcg	cca	gtt	tat	ccg	cat	ttt	gac	acg	atg	ata	gct	gca	384
Lys	Gly	Ile	Ser	Pro	Val	Tyr	Pro	His	Phe	Asp	Thr	Met	Ile	Ala	Ala	
		115					120					125				

tat	ttg	ctg	gag	cca	aac	gag	aaa	aaa	ttc	aat	ctc	gaa	gat	ctg	tct	432
Tyr	Leu	Leu	Glu	Pro	Asn	Glu	Lys	Lys	Phe	Asn	Leu	Glu	Asp	Leu	Ser	
	130					135					140					

ttg	aaa	ttt	ctc	gga	tac	aaa	atg	acg	tct	tat	cag	gaa	ctg	atg	tcg	480
Leu	Lys	Phe	Leu	Gly	Tyr	Lys	Met	Thr	Ser	Tyr	Gln	Glu	Leu	Met	Ser	
145				150					155					160		

ttt	tcc	tca	cca	ctt	ttt	ggt	ttc	agc	ttt	gcg	gat	gtt	ccg	gta	gac	528
Phe	Ser	Ser	Pro	Leu	Phe	Gly	Phe	Ser	Phe	Ala	Asp	Val	Pro	Val	Asp	
				165					170					175		

aag	gct	gcg	aac	tac	tcc	tgc	gag	aat	gct	gac	atc	act	tat	agg	ctc	576
Lys	Ala	Ala	Asn	Tyr	Ser	Cys	Glu	Asn	Ala	Asp	Ile	Thr	Tyr	Arg	Leu	
			180					185					190			

tac	aag	ata	ctc	agc	atg	aag	ctc	cat	gaa	gcg	gaa	ctt	gag	aac	gtc	624
Tyr	Lys	Ile	Leu	Ser	Met	Lys	Leu	His	Glu	Ala	Glu	Leu	Glu	Asn	Val	
		195					200					205				

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa	672
Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu	
210 215 220	
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag	720
Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu	
225 230 235 240	
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata	768
Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile	
245 250 255	
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc	816
Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
260 265 270	
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	864
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
275 280 285	
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag	912
Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu	
290 295 300	
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg	960
His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
305 310 315 320	
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc	1008
Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
325 330 335	
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg	1056
Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg	
340 345 350	
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa	1104
Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu	
355 360 365	
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg	1152
Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
370 375 380	
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct	1200
Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
385 390 395 400	
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc	1248
His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
405 410 415	
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa	1296
Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
420 425 430	
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1344
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
435 440 445	

ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1392
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
450 455 460	
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
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tggtct tga	1833
Trp Ser	
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20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro  
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val  
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asn Ala Asp Ile Thr Tyr Arg Leu  
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
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595 600 605

Trp Ser  
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Met	Lys	Glu	Leu	Gln	Leu	Tyr	Glu	Glu	Ala	Glu	Pro	Thr	Gly	Tyr	Glu	
1				5					10					15		

atc	gtg	aag	gat	cat	aag	acc	ttc	gaa	gat	ctc	atc	gaa	aag	ctg	aag	96
Ile	Val	Lys	Asp	His	Lys	Thr	Phe	Glu	Asp	Leu	Ile	Glu	Lys	Leu	Lys	
			20					25					30			

gag	gtt	cca	tct	ttt	gcc	ctg	gcc	ctt	gaa	acg	tcc	tcc	ctt	gac	ccg	144
Glu	Val	Pro	Ser	Phe	Ala	Leu	Ala	Leu	Glu	Thr	Ser	Ser	Leu	Asp	Pro	
		35				40						45				

ttc	aac	tgt	gag	ata	gtc	ggc	atc	tcc	gtg	tcg	ttc	aaa	ccg	aaa	aca	192
Phe	Asn	Cys	Glu	Ile	Val	Gly	Ile	Ser	Val	Ser	Phe	Lys	Pro	Lys	Thr	
	50					55					60					

gct	tat	tac	att	cca	ctt	cat	cac	aga	aac	gcc	cag	aat	ctt	gat	gaa	240
Ala	Tyr	Tyr	Ile	Pro	Leu	His	His	Arg	Asn	Ala	Gln	Asn	Leu	Asp	Glu	
65					70					75					80	

aca	ctg	gtg	ctg	tcg	aag	ttg	aaa	gag	atc	ctc	gaa	gac	ccg	tct	tcg	288
Thr	Leu	Val	Leu	Ser	Lys	Leu	Lys	Glu	Ile	Leu	Glu	Asp	Pro	Ser	Ser	
				85					90					95		

aag	att	gtg	ggt	cag	aac	ctg	aag	tac	gac	tac	aag	gtt	ctt	atg	gta	336
Lys	Ile	Val	Gly	Gln	Asn	Leu	Lys	Tyr	Asp	Tyr	Lys	Val	Leu	Met	Val	
			100					105					110			

aag	ggt	ata	tcg	cca	gtt	tat	ccg	cat	ttt	gac	acg	atg	ata	gct	gca	384
Lys	Gly	Ile	Ser	Pro	Val	Tyr	Pro	His	Phe	Asp	Thr	Met	Ile	Ala	Ala	
		115					120					125				

tat	ttg	ctg	gag	cca	aac	gag	aaa	aaa	ttc	aat	ctc	gaa	gat	ctg	tct	432
Tyr	Leu	Leu	Glu	Pro	Asn	Glu	Lys	Lys	Phe	Asn	Leu	Glu	Asp	Leu	Ser	
	130					135					140					

ttg	aaa	ttt	ctc	gga	tac	aaa	atg	acg	tct	tat	cag	gaa	ctg	atg	tcg	480
Leu	Lys	Phe	Leu	Gly	Tyr	Lys	Met	Thr	Ser	Tyr	Gln	Glu	Leu	Met	Ser	
145				150						155				160		

ttt	tcc	tca	cca	ctt	ttt	ggt	ttc	agc	ttt	gcg	gat	gtt	ccg	gta	gac	528
Phe	Ser	Ser	Pro	Leu	Phe	Gly	Phe	Ser	Phe	Ala	Asp	Val	Pro	Val	Asp	
				165					170					175		

aag	gct	gcg	aac	tac	tcc	tgc	gag	gat	gca	gac	atc	act	tat	agg	ctc	576
Lys	Ala	Ala	Asn	Tyr	Ser	Cys	Glu	Asp	Ala	Asp	Ile	Thr	Tyr	Arg	Leu	
			180					185					190			

tac	aag	ata	ctc	agc	atg	aag	ctc	cat	gaa	gcg	gaa	ctt	gag	aac	gtc	624
Tyr	Lys	Ile	Leu	Ser	Met	Lys	Leu	His	Glu	Ala	Glu	Leu	Glu	Asn	Val	
		195					200					205				

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344



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Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
450 455 460	
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
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Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
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595 600 605	
tggtct tga	1833
Trp Ser	
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys  
20 25 30

Glu Val Pro Ser Phe Ala Leu Ala Leu Glu Thr Ser Ser Leu Asp Pro  
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val  
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
                             245                            250                            255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
                             260                            265                            270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
                             275                            280                            285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
                             290                            295                            300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
                             305                            310                            315                            320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
                             325                            330                            335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
                             340                            345                            350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
                             355                            360                            365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
                             370                            375                            380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
                             385                            390                            395                            400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
                             405                            410                            415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
                             420                            425                            430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
                             435                            440                            445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
                             450                            455                            460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
                             465                            470                            475                            480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
                             485                            490                            495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
595 600 605

Trp Ser  
610

<210> 30

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<210> 32

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 Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu  
 1 5 10 15

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag 96  
 Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys  
 20 25 30

gag gtt cca tct ttt gcc ctg gac ctt gaa acg tcc tcc ctt gac ccg 144  
 Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro  
 35 40 45

ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca 192  
 Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
 50 55 60

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa 240  
 Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
 65 70 75 80

aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg 288  
 Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
 85 90 95

aag att gtg ggt cag aac ctg aag tac gcg tac aag gtt ctt atg gta 336  
 Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val  
 100 105 110

aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca 384  
 Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
 115 120 125

tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct 432  
 Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
 130 135 140

ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser 145 150 155 160	480
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp 165 170 175	528
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu 180 185 190	576
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val 195 200 205	624
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152

tg	g	a	t	c	g	a	t	t	a	t	a	a	c	a	a	c	t	c	a	t	c	c	t	c	g	t		1200
Trp	Ile	Val	Ser	Ala	Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Ile	Leu	Ala													
385					390					395					400													
cat	ctc	agt	ggt	gat	gag	aac	ctt	gtg	aag	gcc	ttc	gag	gag	ggc	atc												1248	
His	Leu	Ser	Gly	Asp	Glu	Asn	Leu	Val	Lys	Ala	Phe	Glu	Glu	Gly	Ile													
			405						410					415														
gat	gtg	cac	acc	ttg	act	gcc	tcc	agg	atc	tac	aac	gta	aag	cca	gaa												1296	
Asp	Val	His	Thr	Leu	Thr	Ala	Ser	Arg	Ile	Tyr	Asn	Val	Lys	Pro	Glu													
			420					425					430															
gaa	gtg	aac	gaa	gaa	atg	cga	cgg	gtt	gga	aag	atg	gtg	aac	ttc	tct												1344	
Glu	Val	Asn	Glu	Glu	Met	Arg	Arg	Val	Gly	Lys	Met	Val	Asn	Phe	Ser													
		435					440					445																
ata	ata	tac	ggt	gtc	aca	ccg	tac	ggt	ctt	tct	gtg	aga	ctt	gga	ata												1392	
Ile	Ile	Tyr	Gly	Val	Thr	Pro	Tyr	Gly	Leu	Ser	Val	Arg	Leu	Gly	Ile													
		450				455					460																	
ccg	gtt	aaa	gaa	gca	gaa	aag	atg	att	atc	agc	tat	ttc	aca	ctg	tat												1440	
Pro	Val	Lys	Glu	Ala	Glu	Lys	Met	Ile	Ile	Ser	Tyr	Phe	Thr	Leu	Tyr													
465					470					475				480														
cca	aag	gtg	cga	agc	tac	atc	cag	cag	gtt	gtt	gca	gag	gca	aaa	gag												1488	
Pro	Lys	Val	Arg	Ser	Tyr	Ile	Gln	Gln	Val	Val	Ala	Glu	Ala	Lys	Glu													
			485					490					495															
aag	ggc	tac	gtc	agg	act	ctc	ttt	gga	aga	aaa	aga	gat	att	ccc	cag												1536	
Lys	Gly	Tyr	Val	Arg	Thr	Leu	Phe	Gly	Arg	Lys	Arg	Asp	Ile	Pro	Gln													
			500				505					510																
ctc	atg	gca	agg	gac	aag	aac	acc	cag	tcc	gaa	ggc	gaa	aga	atc	gca												1584	
Leu	Met	Ala	Arg	Asp	Lys	Asn	Thr	Gln	Ser	Glu	Gly	Glu	Arg	Ile	Ala													
		515					520				525																	
ata	aac	acc	ccc	att	cag	gga	acg	gcg	gca	gat	ata	ata	aaa	ttg	gct												1632	
Ile	Asn	Thr	Pro	Ile	Gln	Gly	Thr	Ala	Ala	Asp	Ile	Ile	Lys	Leu	Ala													
	530					535				540																		
atg	ata	gat	ata	gac	gag	gag	ctg	aga	aaa	aga	aac	atg	aaa	tcc	aga												1680	
Met	Ile	Asp	Ile	Asp	Glu	Glu	Leu	Arg	Lys	Arg	Asn	Met	Lys	Ser	Arg													
545					550				555					560														
atg	atc	att	cag	gtt	cat	gac	gaa	ctg	gtc	ttc	gag	gtt	ccc	gat	gag												1728	
Met	Ile	Ile	Gln	Val	His	Asp	Glu	Leu	Val	Phe	Glu	Val	Pro	Asp	Glu													
			565					570					575															
gaa	aaa	gaa	gaa	cta	gtt	gat	ctg	gtg	aag	aac	aaa	atg	aca	aat	gtg												1776	
Glu	Lys	Glu	Glu	Leu	Val	Asp	Leu	Val	Lys	Asn	Lys	Met	Thr	Asn	Val													
			580				585					590																
gtg	aaa	ctc	tct	gtg	cct	ctt	gag	gtt	gac	ata	agc	atc	gga	aaa	agc												1824	
Val	Lys	Leu	Ser	Val	Pro	Leu	Glu	Val	Asp	Ile	Ser	Ile	Gly	Lys	Ser													
		595					600					605																
tg	t	t	g	a																							1833	
Trp	Ser																											
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<223> Synthetic

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Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu  
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys  
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro  
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val  
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
180 185 190



Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
595 600 605

Trp Ser  
610

<210> 34

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<222> (1) .. (1830)

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Met	Lys	Glu	Leu	Gln	Leu	Tyr	Glu	Glu	Ala	Glu	Pro	Thr	Gly	Tyr	Glu	
1				5					10					15		

atc	gtg	aag	gat	cat	aag	acc	ttc	gaa	gat	ctc	atc	gaa	aag	ctg	aag	96
Ile	Val	Lys	Asp	His	Lys	Thr	Phe	Glu	Asp	Leu	Ile	Glu	Lys	Leu	Lys	
			20					25					30			

gag	gtt	cca	tct	ttt	gcc	ctg	gcc	ctt	gaa	acg	tcc	tcc	ctt	gac	ccg	144
Glu	Val	Pro	Ser	Phe	Ala	Leu	Ala	Leu	Glu	Thr	Ser	Ser	Leu	Asp	Pro	
		35				40						45				

ttc	aac	tgt	gag	ata	gtc	ggc	atc	tcc	gtg	tcg	ttc	aaa	ccg	aaa	aca	192
Phe	Asn	Cys	Glu	Ile	Val	Gly	Ile	Ser	Val	Ser	Phe	Lys	Pro	Lys	Thr	
	50					55					60					

gct	tat	tac	att	cca	ctt	cat	cac	aga	aac	gcc	cag	aat	ctt	gat	gaa	240
Ala	Tyr	Tyr	Ile	Pro	Leu	His	His	Arg	Asn	Ala	Gln	Asn	Leu	Asp	Glu	
65					70					75					80	

aca	ctg	gtg	ctg	tcg	aag	ttg	aaa	gag	atc	ctc	gaa	gac	ccg	tct	tcg	288
Thr	Leu	Val	Leu	Ser	Lys	Leu	Lys	Glu	Ile	Leu	Glu	Asp	Pro	Ser	Ser	
				85					90					95		

aag	att	gtg	ggg	cag	aac	ctg	aag	tac	gcg	tac	aag	gtt	ctt	atg	gta	336
Lys	Ile	Val	Gly	Gln	Asn	Leu	Lys	Tyr	Ala	Tyr	Lys	Val	Leu	Met	Val	
			100					105					110			

aag	ggg	ata	tcg	cca	gtt	tat	ccg	cat	ttt	gac	acg	atg	ata	gct	gca	384
Lys	Gly	Ile	Ser	Pro	Val	Tyr	Pro	His	Phe	Asp	Thr	Met	Ile	Ala	Ala	
		115					120					125				

tat	ttg	ctg	gag	cca	aac	gag	aaa	aaa	ttc	aat	ctc	gaa	gat	ctg	tct	432
Tyr	Leu	Leu	Glu	Pro	Asn	Gly	Lys	Lys	Phe	Asn	Leu	Glu	Asp	Leu	Ser	
	130				135						140					

ttg	aaa	ttt	ctc	gga	tac	aaa	atg	acg	tct	tat	cag	gaa	ctg	atg	tcg	480
Leu	Lys	Phe	Leu	Gly	Tyr	Lys	Met	Thr	Ser	Tyr	Gln	Glu	Leu	Met	Ser	
145				150					155					160		

ttt	tcc	tca	cca	ctt	ttt	ggg	ttc	agc	ttt	gcg	gat	gtt	ccg	gta	gac	528
Phe	Ser	Ser	Pro	Leu	Phe	Gly	Phe	Ser	Phe	Ala	Asp	Val	Pro	Val	Asp	
				165				170					175			

aag	gct	gcg	aac	tac	tcc	tgc	gag	gat	gca	gac	atc	act	tat	agg	ctc	576
Lys	Ala	Ala	Asn	Tyr	Ser	Cys	Glu	Asp	Ala	Asp	Ile	Thr	Tyr	Arg	Leu	
			180					185					190			

tac	aag	ata	ctc	agc	atg	aag	ctc	cat	gaa	gcg	gaa	ctt	gag	aac	gtc	624
Tyr	Lys	Ile	Leu	Ser	Met	Lys	Leu	His	Glu	Ala	Glu	Leu	Glu	Asn	Val	
		195				200						205				

ttc	tac	agg	ata	gag	atg	ccg	ctt	gtg	aac	gtt	ctt	gca	cgc	atg	gaa	672
Phe	Tyr	Arg	Ile	Glu	Met	Pro	Leu	Val	Asn	Val	Leu	Ala	Arg	Met	Glu	
	210					215					220					

ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392

ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
595 600 605	
tgg tct tga	1833
Trp Ser	
610	
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<223> Synthetic	
<400> 35	
Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu	
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	
20 25 30	

Glu Val Pro Ser Phe Ala Leu Ala Leu Glu Thr Ser Ser Leu Asp Pro  
 35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr  
 50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu  
 65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser  
 85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val  
 100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala  
 115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser  
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser  
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp  
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu  
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val  
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu  
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu  
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile  
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile  
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr  
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu  
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu  
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr  
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg  
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu  
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp  
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala  
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile  
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu  
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser  
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile  
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr  
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu  
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln  
 500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala  
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala  
 530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg  
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu  
 565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val  
 580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser  
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Trp Ser  
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<210> 36

<211> 1716

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<213> Artificial/Unknown

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 Met Leu Glu Thr Ser Ser Leu Asp Pro Phe Asn Cys Glu Ile Val Gly  
 1 5 10 15  
 atc tcc gtg tcg ttc aaa ccg aaa aca gct tat tac att cca ctt cat 96  
 Ile Ser Val Ser Phe Lys Pro Lys Thr Ala Tyr Tyr Ile Pro Leu His  
 20 25 30  
 cac aga aac gcc cag aat ctt gat gaa aca ctg gtg ctg tcg aag ttg 144  
 His Arg Asn Ala Gln Asn Leu Asp Glu Thr Leu Val Leu Ser Lys Leu  
 35 40 45  
 aaa gag atc ctc gaa gac ccg tct tcg aag att gtg ggt cag aac ctg 192  
 Lys Glu Ile Leu Glu Asp Pro Ser Ser Lys Ile Val Gly Gln Asn Leu  
 50 55 60



aag tac gac tac aag gtt ctt atg gta aag ggt ata tcg cca gtt tat	240
Lys Tyr Asp Tyr Lys Val Leu Met Val Lys Gly Ile Ser Pro Val Tyr	
65 70 75 80	
ccg cat ttt gac acg atg ata gct gca tat ttg ctg gag cca aac gag	288
Pro His Phe Asp Thr Met Ile Ala Ala Tyr Leu Leu Glu Pro Asn Glu	
85 90 95	
aaa aaa ttc aat ctc gaa gat ctg tct ttg aaa ttt ctc gga tac aaa	336
Lys Lys Phe Asn Leu Glu Asp Leu Ser Leu Lys Phe Leu Gly Tyr Lys	
100 105 110	
atg acg tct tat cag gaa ctg atg tcg ttt tcc tca cca ctt ttt ggt	384
Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro Leu Phe Gly	
115 120 125	
ttc agc ttt gcg gat gtt ccg gta gac aag gct gcg aac tac tcc tgc	432
Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn Tyr Ser Cys	
130 135 140	
gag gat gca gac atc act tat agg ctc tac aag ata ctc agc atg aag	480
Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu Ser Met Lys	
145 150 155 160	
ctc cat gaa gcg gaa ctt gag aac gtc ttc tac agg ata gag atg ccg	528
Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile Glu Met Pro	
165 170 175	
ctt gtg aac gtt ctt gca cgc atg gaa ttg aac ggg gtg tat gtg gac	576
Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val Tyr Val Asp	
180 185 190	
aca gaa ttc ctg aaa aag ctc tcg gag gag tac ggc aaa aag ctc gag	624
Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys Lys Leu Glu	
195 200 205	
gaa ctg gcc gaa aaa atc tac cag ata gca gga gag ccc ttc aac atc	672
Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro Phe Asn Ile	
210 215 220	
aat tct cca aaa cag gtt tca aag atc ctt ttt gag aag ctg gga ata	720
Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys Leu Gly Ile	
225 230 235 240	
aaa ccc cgt gga aaa acg aca aaa aca gga gcg tac tct acc agg ata	768
Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser Thr Arg Ile	
245 250 255	
gag gtg ttg gaa gag ata gcg aat gag cac gag ata gta ccc ctc att	816
Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val Pro Leu Ile	
260 265 270	
ctc gag tac aga aag atc cag aaa ctg aaa tcg acc tac ata gac acc	864
Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr Ile Asp Thr	
275 280 285	
ctt ccg aaa ctt gtg aac ccg aaa acc gga aga att cat gca tct ttc	912
Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg His Ala Ser Phe	
290 295 300	

cac cag acg ggt acc gcc act ggc agg ttg agt agc agt gat cca aat	960
His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
305 310 315 320	
ctt cag aat ctt ccg aca aag agc gaa gag gga aaa gaa att aga aaa	1008
Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu Ile Arg Lys	
325 330 335	
gcg att gtg ccc cag gat cca gac tgg tgg atc gtc agt gcg gat tat	1056
Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser Ala Asp Tyr	
340 345 350	
tcc caa ata gaa ctc aga atc ctc gct cat ctc agt ggt gat gag aac	1104
Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly Asp Glu Asn	
355 360 365	
ctt gtg aag gcc ttc gag gag ggc atc gat gtg cac acc ttg act gcc	1152
Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr Leu Thr Ala	
370 375 380	
tcc agg atc tac aac gta aag cca gaa gaa gtg aac gaa gaa atg cga	1200
Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu Glu Met Arg	
385 390 395 400	
cgg gtt gga aag atg gtg aac ttc tct ata ata tac ggt gtc aca ccg	1248
Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly Val Thr Pro	
405 410 415	
tac ggt ctt tct gtg aga ctt gga ata ccg gtt aaa gaa gca gaa aag	1296
Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu Ala Glu Lys	
420 425 430	
atg att atc agc tat ttc aca ctg tat cca aag gtg cga agc tac atc	1344
Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg Ser Tyr Ile	
435 440 445	
cag cag gtt gtt gca gag gca aaa gag aag ggc tac gtc agg act ctc	1392
Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val Arg Thr Leu	
450 455 460	
ttt gga aga aaa aga gat att ccc cag ctc atg gca agg gac aag aac	1440
Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg Asp Lys Asn	
465 470 475 480	
acc cag tcc gaa ggc gaa aga atc gca ata aac acc ccc att cag gga	1488
Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro Ile Gln Gly	
485 490 495	
acg gcg gca gat ata ata aaa ttg gct atg ata gat ata gac gag gag	1536
Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile Asp Glu Glu	
500 505 510	
ctg aga aaa aga aac atg aaa tcc aga atg atc att cag gtt cat gac	1584
Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln Val His Asp	
515 520 525	
gaa ctg gtc ttc gag gtt ccc gat gag gaa aaa gaa gaa cta gtt gat	1632
Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu Leu Val Asp	
530 535 540	

ctg gtg aag aac aaa atg aca aat gtg gtg aaa ctc tct gtg cct ctt 1680  
 Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser Val Pro Leu  
 545 550 555 560

gag gtt gac ata agc atc gga aaa agc tgg tct tga 1716  
 Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser  
 565 570

<210> 37

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<213> Artificial/Unknown

<220>

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<223> Synthetic

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Ile Ser Val Ser Phe Lys Pro Lys Thr Ala Tyr Tyr Ile Pro Leu His  
 20 25 30

His Arg Asn Ala Gln Asn Leu Asp Glu Thr Leu Val Leu Ser Lys Leu  
 35 40 45

Lys Glu Ile Leu Glu Asp Pro Ser Ser Lys Ile Val Gly Gln Asn Leu  
 50 55 60

Lys Tyr Asp Tyr Lys Val Leu Met Val Lys Gly Ile Ser Pro Val Tyr  
 65 70 75 80

Pro His Phe Asp Thr Met Ile Ala Ala Tyr Leu Leu Glu Pro Asn Glu  
 85 90 95

Lys Lys Phe Asn Leu Glu Asp Leu Ser Leu Lys Phe Leu Gly Tyr Lys  
 100 105 110

Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro Leu Phe Gly  
 115 120 125

Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn Tyr Ser Cys  
 130 135 140

Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu Ser Met Lys  
 145 150 155 160

Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile Glu Met Pro  
165 170 175

Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val Tyr Val Asp  
180 185 190

Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys Lys Leu Glu  
195 200 205

Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro Phe Asn Ile  
210 215 220

Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys Leu Gly Ile  
225 230 235 240

Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser Thr Arg Ile  
245 250 255

Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val Pro Leu Ile  
260 265 270

Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr Ile Asp Thr  
275 280 285

Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His Ala Ser Phe  
290 295 300

His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn  
305 310 315 320

Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu Ile Arg Lys  
325 330 335

Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser Ala Asp Tyr  
340 345 350

Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly Asp Glu Asn  
355 360 365

Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr Leu Thr Ala  
370 375 380

Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu Glu Met Arg  
385 390 395 400

Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly Val Thr Pro  
405 410 415

Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu Ala Glu Lys  
420 425 430

Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg Ser Tyr Ile  
435 440 445

Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val Arg Thr Leu  
450 455 460

Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg Asp Lys Asn  
465 470 475 480

Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro Ile Gln Gly  
485 490 495

Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile Asp Glu Glu  
500 505 510

Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln Val His Asp  
515 520 525

Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu Leu Val Asp  
530 535 540

Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser Val Pro Leu  
545 550 555 560

Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser  
565 570

<210> 38

<211> 1485

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Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu	
1 5 10 15	
atc gtg aag gat cat aag acc ttc gaa gat ctg tct ttg aaa ttt ctc	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ser Leu Lys Phe Leu	
20 25 30	
gga tac aaa atg acg tct tat cag gaa ctg atg tcg ttt tcc tca cca	144
Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro	
35 40 45	
ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac aag gct gcg aac	192
Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn	
50 55 60	
tac tcc tgc gag gat gca gac atc act tat agg ctc tac aag ata ctc	240
Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu	
65 70 75 80	
agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc ttc tac agg ata	288
Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile	
85 90 95	
gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa ttg aac ggg gtg	336
Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val	
100 105 110	
tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag gag tac ggc aaa	384
Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys	
115 120 125	
aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata gca gga gag ccc	432
Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro	
130 135 140	
ttc aac atc aat tct cca aaa cag gtt tca aag atc ctt ttt gag aag	480
Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys	
145 150 155 160	
ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca gga gcg tac tct	528
Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser	
165 170 175	
acc agg ata gag gtg ttg gaa gag ata gcg aat gag cac gag ata gta	576
Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val	
180 185 190	
ccc ctc att ctc gag tac aga aag atc cag aaa ctg aaa tcg acc tac	624
Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr	
195 200 205	
ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc gga aga att cat	672
Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His	
210 215 220	

gca tct ttc cac cag acg ggt acc gcc act ggc agg ttg agt agc agt	720
Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser	
225 230 235 240	
gat cca aat ctt cag aat ctt ccg aca aag agc gaa gag gga aaa gaa	768
Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu	
245 250 255	
att aga aaa gcg att gtg ccc cag gat cca gac tgg tgg atc gtc agt	816
Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser	
260 265 270	
gcg gat tat tcc caa ata gaa ctc aga atc ctc gct cat ctc agt ggt	864
Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly	
275 280 285	
gat gag aac ctt gtg aag gcc ttc gag gag ggc atc gat gtg cac acc	912
Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr	
290 295 300	
ttg act gcc tcc agg atc tac aac gta aag cca gaa gaa gtg aac gaa	960
Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu	
305 310 315 320	
gaa atg cga cgg gtt gga aag atg gtg aac ttc tct ata ata tac ggt	1008
Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly	
325 330 335	
gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata ccg gtt aaa gaa	1056
Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu	
340 345 350	
gca gaa aag atg att atc agc tat ttc aca ctg tat cca aag gtg cga	1104
Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg	
355 360 365	
agc tac atc cag cag gtt gtt gca gag gca aaa gag aag ggc tac gtc	1152
Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val	
370 375 380	
agg act ctc ttt gga aga aaa aga gat att ccc cag ctc atg gca agg	1200
Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg	
385 390 395 400	
gac aag aac acc cag tcc gaa ggc gaa aga atc gca ata aac acc ccc	1248
Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro	
405 410 415	
att cag gga acg gcg gca gat ata ata aaa ttg gct atg ata gat ata	1296
Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile	
420 425 430	
gac gag gag ctg aga aaa aga aac atg aaa tcc aga atg atc att cag	1344
Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln	
435 440 445	
gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag gaa aaa gaa gaa	1392
Val His Asp Glu Leu Val Val Glu Glu Val Pro Asp Glu Glu Lys Glu Glu	
450 455 460	

cta gtt gat ctg gtg aag aac aaa atg aca aat gtg gtg aaa ctc tct 1440  
 Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser  
 465 470 475 480

gtg cct ctt gag gtt gac ata agc atc gga aaa agc tgg tct tga 1485  
 Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser  
 485 490

<210> 39

<211> 494

<212> PRT

<213> Artificial/Unknown

<220>

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<223> Synthetic

<400> 39

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu  
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ser Leu Lys Phe Leu  
 20 25 30

Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro  
 35 40 45

Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn  
 50 55 60

Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu  
 65 70 75 80

Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile  
 85 90 95

Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val  
 100 105 110

Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys  
 115 120 125

Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro  
 130 135 140

Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys  
 145 150 155 160



Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser  
 165 170 175

Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val  
 180 185 190

Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr  
 195 200 205

Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His  
 210 215 220

Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser  
 225 230 235 240

Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu  
 245 250 255

Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser  
 260 265 270

Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly  
 275 280 285

Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr  
 290 295 300

Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu  
 305 310 315 320

Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly  
 325 330 335

Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu  
 340 345 350

Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg  
 355 360 365

Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val  
 370 375 380

Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg  
 385 390 395 400

Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro  
 405 410 415

Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile  
 420 425 430

Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln  
 435 440 445

Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu  
 450 455 460

Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser  
 465 470 475 480

Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser  
 485 490

<210> 40

<211> 24

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc\_feature

<223> Synthetic

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<210> 41

<211> 74

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc\_feature

<223> Synthetic

<400> 41

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60

agtgagtcgt atta

74

<210> 42

<211> 25

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	taatacgact cactataggg cgaat	25
<210>	43	
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<223>	Synthetic	
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	gaatcgtcgt atgcagtgaa aactc	25
<210>	44	
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<212>	DNA	
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<223>	Synthetic	
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<210>	45	
<211>	33	
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<400> 45	
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cggataacaa tttcacacag gatttaaac	29
<210> 47	
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taatacgact cactataggg cgaat	25
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<400> 48	
catgccatgg catgcattta cgttgacacc a	31
<210> 49	
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<220>

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<223> Synthetic

<400> 49

tcccccggtg tgcgtcact gcccgcttcc cagt

34

<210> 50

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<223> Synthetic

<400> 50

agcttatcga tggcactttt cggggaaatg tgcg

34

<210> 51

<211> 35

<212> DNA

<213> Artificial/Unknown

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<223> Synthetic

<400> 51

agcttatcga taagcgatgc cgggagcaga caagc

35

B<sup>1</sup>  
cont.